5.17 LIGHT EMISSIONS

5.17.1 Background

Airports use high-intensity lights to illuminate their runways, taxiways, gate areas, and to supply the visual approach navigational aids that are critical to the safe operation of the airport. This section assesses the impact of airport-related light emissions upon the personnel in the ATCT and pilots, and the residential areas surrounding Gary/Chicago International Airport resulting from the Proposed Action.

FAA Order 5050.4*, Airport Environmental Handbook*, states that "the extent to which any lighting associated with an airport action will create an annoyance among people in the vicinity of the installation" shall be examined. Only in unusual circumstances, such as when high intensity strobe lights would shine directly into peoples' homes, will the impact of light emissions be considered sufficient to warrant special study and a more detailed examination of alternatives in an environmental impact statement.

5.17.2 Methodology

The light emissions analysis has included identification of the site location and a description of the light system's purpose, installation, beam angle, intensity, color, flashing sequence (if applicable), and pertinent characteristics. If necessary, measures to lessen any annoyance, such as shielding or angular adjustment, will also be considered. Also, on and off-airport lighting that could have an impact of the vision of on pilots and personnel in the airport traffic control tower to the runway environment will be considered.

5.17.3 Existing Conditions – 2000

Lighting required for security and navigation are chief contributors to light emissions radiating from developed areas. There are six types of lighted navigational aids (navaids) on existing Runway 12-30:

- High Intensity Runway Edge Lights (HIRL) – Lights that are placed along the edge of a runway, generally at 200-foot intervals, are designed to assist pilots in identifying the edge of the surface prepared for landings and takeoffs. This is the most intense runway edge lighting system and is most readily found at high-activity airports having wider runways and precision instrument approaches.
- Precision Approach Path Indicators (PAPI) on both the Runway 12 and 30 ends – Navigational aid to visually identify the glide path to the runway. A series of four steady burn PAPI lights project red and white beams from the approach end of the runway.

- Runway End Identifier Lights (REILs) on Runway 12 – Two synchronized white flashing lights, one on each side of the runway threshold, that provide rapid and positive identification of the approach end of a particular runway.
- Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) on Runway 30 – A lane of lights, coupled with flashing strobe lights, to assist pilots in visually identifying the runway environment, installed in conjunction with an Instrument Landing System precision approach. The MALSR system extends approximately 2,400 feet beyond the end of Runway 30 and crosses the Toll Road.
- Guidance Signs – Along runway and taxiway as required by FAA standards. Lighted signs to identify the runways, taxiways, aprons and other pertinent areas on the airport for the purpose of information to aircraft maneuvering on the ground.
- Distance to Go Signs – Along the runway edge to identify the remaining runway length for an arriving or departing aircraft.

In addition, there are medium intensity runway lights on the crosswind runway, Runway 2-20. Also, there is flood lighting around the existing terminal building and parking lot to aid in use of these facilities during periods of darkness and security. Generally, lights located at the runway thresholds and in the approach area pose the greatest concern for potential impacts.

In addition to the vehicle lights, there are existing high mast highway lights on the Toll Road near the Cline Avenue interchange that extend across the end of the crosswind runway and on Cline Avenue northwest of Runway 12. The only light sources from the railroad are the engine lights and track signalization.

5.17.4 Future Conditions – 2007

5.17.4.1 No Action

Under the no action alternative there would be no change in the airport facilities, so there would be no change from the existing lighting at the airport and no new light emissions would be introduced. There would also be no change in the on and off-airport light sources surrounding the airport to affect pilots or airport traffic control tower personnel's vision.

5.17.4.2 Improvements to Existing Runway 12-30 to Conform to FAA Standards

Improvements associated with existing Runway 12-30 include a shift of the runway threshold approximately 546 feet to the northwest. To support this shift the HIRLs, PAPIs, REILs, and MALSR would also need to shift approximately 546 feet to the northwest in order to be located in the appropriate location relative to the runway environment. Guidance signs and distance to go signs would be relocated as appropriate to identify the new location of the runway threshold.

Taxiway A would also be extended 546 feet to the northwest with its associated medium intensity taxiway lights (MITLs).

The EJ&E Railway would be relocated as a part of meeting the runway safety area requirements on the northwest end of Runway 12-30. The proposed railroad relocation route goes through the proposed airport acquisition area, parallels Cline Avenue on the east side, crosses Chicago Avenue, and then parallels it north of the existing businesses along Cline Avenue. The only lighting associated with the railroad relocation would be on the engine and track signalization. By remaining east of Cline Avenue, this roadway will serve as a buffer between the relocated rail alignment and the light sensitive residential development to the northwest. With the existing roadway as a buffer, no new significant light emission impacts are anticipated on light sensitive uses.

On the south end, this shift would be beneficial moving all of the airfield light sources farther from existing residential development. In addition to being farther from the residential development, the relocated MALSR and PAPIs on the south end will continue to be directed at an upward angle, which would project the light patterns above the residences.

On the north end, this shift would move the airfield light sources approximately 546 feet closer to the residential development, but keep it within the existing roadway system (Cline Avenue, Chicago Avenue and Industrial Highway) on existing or to-be-acquired airport property. Major roadways such as Cline Avenue, Chicago Avenue and Industrial Highway, and industrial development provide a buffer of non-light sensitive land uses around the periphery of the airport. The closest residential development north of Runway 12 would still remain beyond the existing roadway system buffer. Also, the PAPIs and REILs are located at or near the runway threshold and are directed at an upward angle, which would project the light patterns above the residences north of the airport. Therefore, no significant off airport light emission impacts are anticipated.

On the south end, the threshold shift would move the runway environment farther from the off-airport light sources. On the north end, the threshold shift would move the runway environmental closer to off-airport light sources. The relocation of the railroad parallel to Cline Avenue is not anticipated to create a significant new off-airport light source since its light emissions are limited to the engine light, when present, and the track signalization, neither of which would project directly into the approach to the runway. Lighting along Cline Avenue could become a more significant off-airport light source, although it will still remain at least 1,000 feet from the runway end. Similar to the interchange lighting in close proximity to the end of Runway 2, during the design of the runway extension consideration can be given to lowering, shielding, and/or redirecting the lights downward to avoid significant impacts on pilots or airport traffic control personnel looking at the Runway 12 environment.

5.17.4.3 Improvements to Provide Additional Runway Length on Runway 12-30

Improvements associated with the extension of Runway 12-30 include an approximately 1,354-foot extension to the northwest on Runway 12 that is proposed in conjunction with the approximately 546-foot extension to Runway 12 to provide safety areas conforming to FAA standards (total extension 1,900 feet). To support these runway improvements the HIRLS would be extended approximately 1,900 feet to the northwest from today's location, and the Runway 12 PAPIs and REILs would be relocated approximately 1,900 feet to the northwest. The Runway 30 PAPIs and MALSR would be relocated approximately 546 feet to the northwest per the Runway 30 threshold displacement using declared distance standards. Guidance signs would be added or relocated as appropriate with the new runway environment. Distance to go signs would be relocated and added as necessary to identify the new runway length and support the declared distance standards.

On the south end, the displacement of the Runway 30 threshold would beneficially move all the airfield light sources approximately 546 feet farther from existing residential development, as addressed above. On the north end, the runway extension would move the airfield light sources approximately 1,900 feet closer to residential development, but keep it within the existing roadway system buffer (Cline Avenue, Chicago Avenue and Industrial Highway) and on existing or to-be-acquired airport property. As discussed above, the PAPIs and REILs are directed at an upward angle, which would project the light patterns above the residences. Therefore, no significant off airport light emission impacts are anticipated with improvements associated with the extension of Runway 12-30.

5.17.4.4 Expansion of Existing Terminal

The expansion of the existing terminal building would include associated use and security lighting similar to the existing terminal building. The terminal building expansion is located on existing airport property well within the airport's boundaries. Industrial Highway is north of the terminal building with undeveloped or industrial uses on the other side of the highway. Therefore, there are no light sensitive land uses in the vicinity of the terminal building. Therefore, there are no significant off-airport light emission impacts anticipated from expansion of the existing terminal building. Lighting around the terminal and ramp would be shielded or directed to prevent interference with the vision of pilots or personnel in the airport traffic control tower.

5.17.4.5 Acquisition and/or Reservation of Sites for Future Passenger Terminal and Air Cargo Facilities

The reservation of areas for potential long-term aviation development only involves the acquisition of and remediation, as necessary, of property to be reserved for future aviation use. No lighting improvements are anticipated on this property until such time that the purpose and need for the actual development of this more-extensive infrastructure has been demonstrated. Therefore, there

are no significant on and off-airport light emission impacts associated with reservation of areas for potential long-term development.

5.17.5 Summary of Findings

All airfield and terminal lighting improvements will occur within the existing airport property boundary or within the area to be acquired as a part of the Proposed Action. The airfield lighting improvements will shift the light sources approximately 546 feet farther from any light sensitive land uses located southeast of the existing runway. To the northwest, the runway extension will shift airport light sources approximately 1,900 feet closer to light sensitive development; however, residential development is located beyond the major roadway serving the area (Cline Avenue), which would continue to serve as a buffer from airport light emissions and is further from the airport than residential development to the southeast. No significant off-airport light emission impacts are anticipated. Any on and off-airport light impacts from the terminal or roadway lighting on pilots or airport traffic control tower personnel should be able to be addressed during the design of the runway extension and terminal expansion through use of shielding, lowering and/or redirecting the light source, without affecting its utility for the terminal or roadway.

5.17.6 Mitigation

No mitigation measures from on-airport lighting are required. If any impacts were to arise in the future, the mitigation could be provided through the use of barriers and shield to block light from impacting any residences. If mitigation of off-airport light impacts is needed it will be considered during the design of the runway extension and terminal expansion through the use of shielding, lowering and/or redirecting the light sources to protect the pilots and airport traffic controller vision of the runway environment.

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